TABLE I-continued

AGAROSE* DERIVATIVES FOR GEL SIEVING PROPERTIES

AGAROSE DERIVATIVE R = AGAROSE	DESIRABLE PROPERTIES
(26) $R-O-\overset{O}{\overset{\|}{C}}-NH-(CH_2)_n-NH-GLU-P$ or GLU, P, E, L = as above $R-O-\overset{O}{\overset{\|}{C}}-NH-(CH_2)_n-NH\ GLU-E$ or $R-O-\overset{O}{\overset{\|}{C}}-NH-(CH_2)_n-NH-GLU-L$ n = 2-6	Sieving plus special biological affinity sugar moiety selectivity and/or substrate specificity
(27) $R-NH(CH_2)_n-NH-P$ n = 2-6 E or L can substitute for P	Sieving and special biological affinity, sugar moiety selectivity and/or substrate specificity
(28) $R-O-CH_2\overset{O}{\overset{\|}{C}}-NH-P$ E or L can substitute for P	Sieving and special etc. as above
(29) $R-O-\underset{\underset{[CH-CONH_2]_n}{\|}}{CH}-CONH_2$ n = 1-2000	Sieving

TABLE II

Relative Resolving Power of Various Electrophoretic Gel Sieving Media

Gel Composition	Conc. (%)	Resolution (No.# of Protein Bands) Protein A	Protein B	Protein C	Protein D
Gelidium-derived Agarose	4.0	2	1	4	2
Gelidium-derived Agarose containing 9.0% hydroxyethylation	4.0	4	3	5	4
Polyacrylamide	5.0	2	1	3	1
Polyacrylamide	7.5	5	5	2	4

Protein Code	Identification
A	Ovalbumin (MW = 43,000; pI = 4.7)
B	Bovine serum albumin (MW = 67,000; pI = 4.7)
C	Ferritin (MW = 440,000; pI = 4.5)
D	Thyroglobulin (MW = 669,000; pI = 4.5)

Note:
Many of the above proteins contain subunits or otherwise display microhetero geneity

TABLE III

Agarose Gel Pore Size Reduction by Derivatization

Genus from which the agarose was derived	Wt. % of Derivative	Gel Conc.	Average pore diameter ± standard deviation (Mμ)
(1) Gelidium	0	4%	106 ± 52
(2) Gelidium	4	4%	69 ± 52
(3) Gelidium	9	4%	42 ± 18

What is claimed is:

1. A method of separating biological mixtures by subjecting them to gel electrophoresis using as the gel matrix a derivatized agarose containing at least one substituent having a preselected conformational shape such that the pore diameter of the derivatized agarose is not reduced below about 10° A units, the D.S. being from about 0.001 to about 2.0, whereby the components in said mixture are separated as a function of their molecular size.

2. The method according to claim 1 wherein the substituent is 2-hydroxyethyl.

3. The method according to claim 1 wherein the biological mixtures are DNA fragments.

4. The method according to claim 1 wherein the biological mixtures are proteins.

5. A derivatized agarose, useful as an electrophoretic sieving gel, containing at least one substituent having a molecular weight range greater than 100 to about 1,000,000 and a preselected conformational shape such that the average pore diameter of the derivatized agarose is not reduced below about 10° A units, the D.S. being from about 0.001 to about 2.0.

6. The derivatized agarose according to claim 5 wherein the substituent is attached to the agarose molecule via a linkage selected from the class consisting of ether, ester, amide, amine, isourea, and carbamate linkages.

7. The derivatized agarose according to claim 6 wherein the substituent is attached to the agarose molecule via an ether linkage.

8. The derivatized agarose according to claim 6 wherein the substituent is attached to the agarose molecule via an ester linkage.

9. The derivatized agarose according to claim 6 wherein the substituent is attached to the agarose molecule via an amide linkage.